

IN THE CLAIMS

1-13 (canceled).

14. (previously presented) A method for producing a micromachined layered device comprising a membrane layer having a first side and a second side, a first layer on said first side of said membrane layer and a second layer on said second side of said membrane layer, said method comprising applying said membrane layer to a substrate, opening a window in said substrate whereby both sides of said membrane layer can be exposed for the addition of further layers thereonto while a portion of said substrate comprising a substrate frame supports said membrane layer during processing thereof, adding at least one layer to each of said first and second sides of said membrane layer, and removing said device from said substrate frame.

15. (previously presented) The method of claim 14 wherein said opening of said window in said substrate comprises a process selected from the group consisting of laser ablation, wet chemical etching, solvating, and dry etching.

16. (previously presented) The method of claim 15 wherein said dry etching comprises a method selected from the group consisting of reactive ion etching and sputter etching.

17. (previously presented) The method of claim 14 wherein said removing of said device from said substrate frame comprises a process selected from the group consisting of wet chemical etching, reactive ion etching, dicing/sawing, cutting, laser ablation, and punching.

18. (previously presented) The method of claim 17 wherein said cutting is carried out by means of a device selected from the group consisting of a scissors and a knife.

19 (currently amended) The method of claim 14 ~~including~~ further comprising a patterning step for altering the lateral dimensions of one of said layers of said device.

20. (previously presented) The method of claim 19 wherein said patterning step comprises a process selected from the group consisting of photolithography and soft lithography.

21. (previously presented) The method of claim 14 wherein said substrate comprises a material selected from the group consisting of a polymer, a semiconductor, a metal, an alloy, and glass.

22. (previously presented) The method of claim 21 wherein said semiconductor comprises silicon.

23. (previously presented)The method of claim 21 wherein said metal comprises titanium.

24. (previously presented)The method of claim 21 wherein said alloy comprises stainless steel.

25. (currently amended) The method of claim 14 ~~including—further comprising~~ adding at least one additional layer to said device, said additional layer and said membrane layer comprising a material selected from the group consisting of a metal, a metal oxide, an alloy, and a ceramic.

26. (previously presented)The method of claim 25 wherein said alloy comprises an alloy of a metal selected from the group consisting of gold, platinum, titanium, stainless steel, aluminum oxide, and nickel titanium alloy.

27. (previously presented)The method of claim 25 wherein said ceramic comprises hydroxyapatite.

28. (currently amended) The method of claim 14 ~~including—further comprising~~ adding at least one additional layer to said device, said at least one additional layer comprising a conducting polymer or copolymer.

29. (previously presented)The method of claim 28 wherein said conducting polymer or copolymer comprises a monomer selected from the group consisting of pyrrole, aniline, thiophene, para-phenylene, vinylene, phenylene, and substituted forms of said monomers.

30. (currently amended) The method of claim 14 ~~including—further comprising~~ adding at least one additional layer to said device, said at least one additional layer and said membrane layer comprising a polymer comprising a monomer selected from the group consisting of polyimide, polyamide, polyurethane, poly-(tetrafluorethylene), poly-(dimethylsiloxan), poly-(methylmethacrylate), polyesters, poly(vinyl chloride), and polyethylene, and substituted forms of said monomers.

31. (previously presented)The method of claim 14 wherein said opening of said window in said substrate comprises selectively removing a portion of said substrate under said membrane layer over an area greater than the predetermined final size of said device, whereby said removing of said device from said substrate frame comprises said membrane freely hanging in said substrate support frame providing access from both sides for additional processing, and including adding at least one additional layer to each side of said membrane.

32. (previously presented)The method of claim 31 wherein said selective removal of said portion of said substrate comprises wet chemical etching.

33. (previously presented)The method of claim 31 wherein said at least one additional layers added to each side of said membrane are added simultaneously.

34. (previously presented)The method of claim 31 wherein said at least one additional layers added to each side of said membrane are added separately.

35. (previously presented)The method of claim 14 wherein said removing of said device from said substrate frame comprises partially cutting said device from said substrate frame, activating said partially cut device, and completely cutting said device from said substrate frame.

36. (previously presented)The method of claim 14 wherein said micromachined layered device comprises an actuator, and including activating said device removed from said substrate frame.

37. (previously presented)The method of claim 14 wherein said micromachined layered device comprises a microactuator.